NORTH KERN W.S.D

CEC APLRP Project Case Studies

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Prepared for

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NORTH KERN WATER STORAGE DISTRICT

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Project 1. Addition of Reservoirs and Modification of Groundwater Pumping Wells

Site

The North Kern Water Storage District (NKWSD) is located in the San Joaquin portion of Kern County and encompasses nearly 60,000 acres. The district receives water from the Kern River and groundwater supplies to supply its users.

Project Description

The district proposed and designed a project that curtailed 5.135 MW of peak load. The application for this project was received on June 12, 2001. The project was started April 24, 2001 and fully completed August 31, 2001. The district had enough of the major construction completed by June 1, 2001 that they were able to curtail the entire 5.135 MW of peak load from June – September 2001. NKWSD received the first 50% of the grant in December 2001. Final verification was completed and the district received their final grant payment in February 2002.

The project included the construction and use of storage reservoirs to supply water to users during the peak period, allowing groundwater pumps to be turned off. Older well casings were lined to prevent casing failure. Timers were installed on each well control panel in the program to automatically shut the well off during the peak period.

Verification

Verification of load curtailment through the peak period was completed by comparing post-project and pre-project time-of-use meter billing for the pumps within the scope of the project. NKWSD has two major supply sources, the Kern River and groundwater. If deliveries from the Kern River are below normal, the district must supplement using groundwater pumps. In 1992, the deliveries from the Kern River most closely matched deliveries during 2001 (post-project verification year). Therefore, NKWSD used power usage records for 1992 for their baseline pre-project peak load.

Project Results

Summary Category	Results
Total Project Cost	$532,623
Total Grant Payment	$346,205
Actual kW Reduced	5,135
Grant Payment per kW Reduced	**$67.42**

Project 2. Addition of Telemeter and Modification of Groundwater Pumping Wells

Site

The North Kern Water Storage District (NKWSD) is located in the San Joaquin portion of Kern County and encompasses nearly 60,000 acres. The district receives water from the Kern River and groundwater supplies to supply its users.

Project Description

The district proposed and designed a project that curtailed 3.255 MW of peak load. The application for this project was received on October 30, 2001. The project was started December 1, 2001 and fully completed December 31, 2002. NKWSD received the first 50% of the grant in January 2003. Final verification was completed and the district received their final grant payment in October 2003.

The peak load reduction was accomplished by equipping wells with clock timers to turn the wells off before 12 PM and back on after 6 PM. In addition, older wells were rehabilitated to withstand frequent start-ups, and modifications were made to the pump discharges to reduce the impact of operation to the landowners. The proposal also included installation of, or modification to, a siphon, pumping bays, and weirs to increase the storage capacity of regulating reservoirs, thereby reducing the peak period electrical demand. Additionally, seventeen telemetry sites were installed to monitor water levels and provide data via radio to the district office computer.

Verification

Verification of load curtailment through the peak period was completed by comparing post-project and pre-project time-of-use meter billing for the pumps within the scope of the project.

Project Results

Summary Category	Results
Total Project Cost	$1,345,130
Total Grant Payment	$813,750
Actual kW Reduced	3,255
Grant Payment per kW Reduced	**$250**

Photographs

Telemetry sites

Approximately 16 sites will have telemetry installed by November 2002. All of the reservoirs that are pictured in this report will have at least one monitoring site. In addition, major canal structures will also have remote monitoring capability.

Telemetry site near the head of the Calloway Canal.

Reservoirs

Some of the major work that has been completed by NKWSD was the addition of reservoir storage to supply the district during the peak period. The district built or expanded 3-5 reservoirs as well as converted large open channel pools that are normally used for groundwater recharge in wet years, to reservoir. The bottoms of these pools have been laser leveled. Booster stations were installed to pump water from the reservoirs back to the distribution system.

Reservoir on the Calloway Canal.

Outlet into the CT-1 Canal (smaller distribution canal that parallels the Calloway).

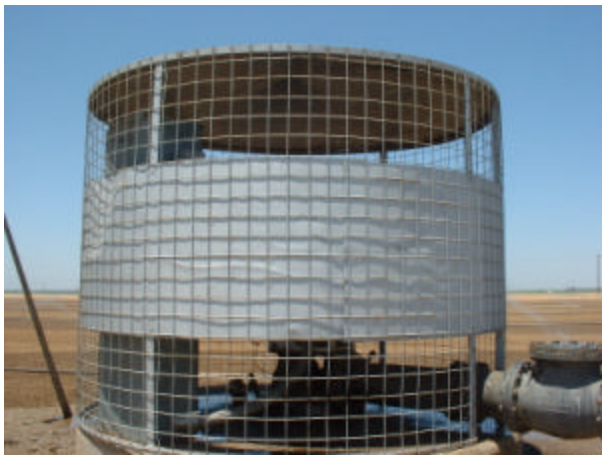
Pumping station on a Calloway Canal reservoir that operates during the peak period to supply the CT-1 canal (pictured on the left side of the bottom picture).

The district has installed a pump station (CT-1-9-2) that allows water to be pumped from lower reaches of the CT-1 canal to upper reaches so that water can be stored in uphill reservoirs during the peak period.

The two top pictures show a pumping station in a reservoir that supplies a district lateral. The bottom picture is the discharge and intake in the lateral from that reservoir.

This is a 90 AF reservoir and pump station just west of the districts main canal (Lerdo Canal). Water gravities into the reservoir during the off peak and the pump station is used to supply Lerdo Canal during the peak period.

Gravity in, gravity out reservoir on a steep lateral. The bottom picture shows an inlet 200-300 yards upstream from the reservoir.



The major component of this project was to turn the districts groundwater pumps off during the peak period. The district lined the wells, replaced worn column pieces, added across the line starters, and automatic timers. In some cases, the district also replaced the pump discharge. 61 wells were included in the APLRP totaling approximately 8-12 MW.

Wells in the Program

2001 Wells	
Well #	Billing Demand KW
8-00-006	156
8-00-036	112
8-00-047	298
8-00-051	136
8-00-055	255
8-00-057	278
8-00-059	306
8-00-070	146
8-00-081	243
8-00-085	300
8-00-088	174
8-00-090	244
8-03-009	136
8-03-036	135
8-03-047	255
8-05-003	252
8-05-011	300
8-07-004	188
8-07-006	300
8-17-009	187
8-17-015	300
8-17-059	254
8-19-003	292
8-21-005	277
8-21-016	274
8-25-016	225
8-25-031	225
9-00-009	163
9-00-012	261
9-00-017	238
9-00-035	235
9-02-004	295
9-22-014	300
9-22-084	150
9-26-026	291
	8,181

2002 Wells	
Well #	Billing Demand KW
8-00-063	275
8-00-093	178
8-03-021	154
8-17-022	275
8-29-039	154
9-00-003	140
9~00-006	140
9-00-008	132
9-00-022	134
9-00-026	139
9-00-032	142
9-00-081	134
9-00-084	156
9-00-090	138
9-00-096	134
9-00-102	151
9-00-106	148
9-00-108	144
9-00-114	137
9-00-117	142
9-00-119	150
9-22-010	145
9-22-029	136
9-22-041	205
9-26-010	147
9-26-085	150
	4,080

The billing demand is the maximum 15 minute average demand for one months billing cycle. The actual demand in the program is somewhat lower. For example the actual demand that was shed in 2001 was 5.1 MW not 8.181 MW.